WHAT IS CLAIMED:

1. A computer with a monitor viewable program that executes to display a histogram of image data on the monitor, the monitor contemporaneously displaying a screen image viewed on a monitor displaying the histogram, and displays a digital or analog control element that controls both compression and expansion of midtones, wherein activation of the midtone compression/expansion element accordingly alters the displayed image according to effects of programs underlying the control of the element, this histogram display and element being associated on a single logical screen display in which at least one other image data modification effect is present on the screen image as a cursor addressable or keyboard selectable image data modification effect.

2. The computer with a monitor viewable program of claim 1 wherein the at least one other image data modification effect includes at least one function selected from the group consisting of clipping, lightness adjustment, output range compression or expansion, access to multiple look-up table functions, and contrast adjustments.

3. The computer with a monitor viewable program of claim 1 wherein the control element comprises a slider that controls both compression and expansion.

4. The computer with a monitor viewable program of claim 1 wherein the control element comprises a single control that controls both compression and expansion.

5. The computer with a monitor viewable program of claim 4 wherein the at least one other image data modification effect includes at least one function selected from the group consisting of clipping, lightness adjustment, output

range compression or expansion, access to multiple look-up table functions, and contrast adjustments.

6. The computer with a monitor viewable program of claim 4 wherein adjacent the slider are representations of a midtone expansion curve and a midtone compression curve.

7. The computer with a monitor viewable program of claim 4 wherein a histogram with an active tone reproduction curve display shows combined effects of midtone corrections and the at least one function.

8. The computer with a monitor viewable program of claim 5 wherein the at least one other image data modification effect includes at least one function selected from the group consisting of clipping, lightness adjustment, output range compression or expansion, access to multiple look-up table functions, and contrast adjustments.

9. A system for processing of image data comprising a computer that provides data to a video monitor, the data including virtual representations of a dialog on image data including at least one screen image viewed on the monitor that displays a histogram, and displays a digital or analog control element that controls both compression and expansion of midtones, wherein activation of the midtone compression/expansion element accordingly alters the displayed image according to effects of programs underlying the control of the element, this histogram display and element being associated on a single logical screen display in which at least one other image data modification effect appears on the virtual image and is a cursor addressable image data modification effect.

10. A computer with a monitor viewable program that executes to display a histogram of image data on the monitor, the monitor contemporaneously displaying a screen image viewed on a monitor that displays the histogram,

and displays a digital or analog control element that controls both compression and expansion of midtones, wherein activation of the midtone compression/expansion element accordingly alters the displayed image according to effects of programs underlying the control of the element, this histogram display and element being associated on the monitor display.

11. The computer and monitor viewable program of claim 1 wherein all effects implemented on the histogram, including at least the midtone expansion and compression program, are simultaneously incorporated into the image displayed.

12. A computer with a video monitor viewable program provided by software that displays a) a screen image viewed on a monitor displaying a histogram of image data, b) a digital slider and/or analog control element that controls compression and expansion of midtones and wherein activation of the midtone compression/expansion element accordingly alters the displayed image according to effects of programs underlying the movement of the element, the histogram display and element being associated on a single screen display in which c) at least an image data modification control other than midtone compression and expansion that can effect the histogram selected from the group consisting of clipping, output range compression or expansion, access to multiple look-up table functions, and contrast adjustments is also available on the screen display.

13. The computer with a video monitor viewable program provided by software of claim 11 wherein all effects implemented on the histogram, including at least the midtone expansion and compression program, are simultaneously incorporated into the image displayed.

14. The computer with a video monitor viewable program of claim 11 wherein the image data represents real or artificial images of persons, animals, flora,

scenery, stellar scenes, weather events, thermal events, rooms, dwellings, vehicles, microscopic scenes, microscopic events, or cartoon figures.

15. The computer with a video monitor viewable program of claim 11 wherein the image data relates to digital images of photographs and web graphics.

16. The computer and monitor viewable program of claim 1 wherein luminance of the image is calculated from a combination of the RGB channels for a color image or by using the brightness values directly for a grayscale image.

17. The computer and monitor viewable program of claim 1 wherein color channels of the image are processed either individually or by making independent changes to all channels at once.

18. The computer and monitor viewable program of claim 1 wherein the program also clips low intensities.

19. The computer and monitor viewable program of claim 16 wherein clipping is effected by converting all channel values below a threshold T to the value Y_{min} so that the remaining values lie from T to X_{max} and then linearly stretching these latter values to the interval X_{min} to X_{max}.

20. The computer and monitor viewable program of claim 17 wherein the stretching is accomplished with the algorithm:

$$Y = \begin{cases} Y_{min}, & X < T. \\ Y_{min} + (Y_{max} - Y_{min})(X - T) / (X_{max} - T). \end{cases}$$

21. The computer and monitor viewable program of claim 16 wherein clipping of high intensities is effected by the program.

22. The computer and monitor viewable program of claim 19 wherein the clipping is effected by application of an algorithm to convert all channel values above a threshold T to Y_{max} so that the remaining values lie from X_{min} to T and then linearly stretch these latter values to the interval X_{min} to X_{max}.

23. The computer and monitor viewable program of claim 19 wherein the stretching is accomplished with

$$Y = \begin{cases} Y_{max}, & X > T. \\ Y_{max} - (Y_{max} - Y_{min})(T-X)/(T-X_{min}). \end{cases}$$

24. The computer and monitor viewable program of claim 1 wherein a tilde function is used for contrast adjustment.

25. The computer and monitor viewable program of claim 1 wherein a gamma function is used for contrast adjustment.

26. The computer and monitor viewable program of claim 25 wherein the gamma function comprises:

$$Y = Y_{max}(X/X_{max})^{1/\gamma}$$

27. The computer and monitor viewable program of claim 24 wherein the tilde function comprises:

$$Y = Y_{max}\, exp\{-b\,[ln\,(X_{max}/X)\,]^p\,\}$$